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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/067,050 | 02/04/2002 | Scott A. Leman | 27581/01314 | 4929 |

4743 7590 09/09/2003

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|---|---|
| CORRIGAN, JAIME W | |
| ART UNIT | PAPER NUMBER |
| 3748 | 7 |

DATE MAILED: 09/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/067,050 | LEMAN ET AL. | |
| | Examiner | Art Unit | |
| | Jaime W Corrigan | 3748 | |

*-- The MAILING DATE of this communication app ars on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Vorih et al. (PN 5,829,397).

Regarding claim 1 Vorih discloses an engine cylinder (See Abstract Lines 1-2); an engine piston (See Abstract Lines 1-2) reciprocatingly disposed in the engine cylinder; a valve (See Figure 8)) operatively associated with the engine cylinder; a mechanically (See Figure 8 (Exhaust Rocker)) driven actuator assembly adapted to open the valve; a fluidically driven actuator (See Figure 8 (102), (104)) adapted to open the valve; at least one sensor (See Column 9 Lines 28-32) associated with the engine and adapted to generate an operation signal representative of an engine operation; and a controller (See Figure 2A (400)) adapted to receive the operation signal and transmit (See Figures 1, 2A, 8, Column 8 Lines 44-67, Column 9 Lines 1-7) a control signal to the fluidically driven actuator and opening the valve based on the operation signal.

Regarding claim 2 Vorih discloses the fluidically driven actuator is in constant communication with one of a source of high pressure fluid and a source of low pressure fluid (See Figure 2A (410), (412), (612).

Regarding claim 3 Vorih discloses the controller generates the control signal during a compression stroke (See Abstract Lines 8-10) of the engine.

Regarding claim 4 Vorih discloses the controller generates the control signal during an intake stroke (See Abstract Lines 8-10) of the engine.

Regarding claim 5 Vorih discloses the valve is an intake valve (See Column 11 Lines 14-18).

Regarding claim 6 Vorih discloses the valve is an exhaust valve (See Column 11 Lines 14-18).

Regarding claim 7 Vorih discloses the control signal actuates the fluidically driven actuator a predetermined length of time (See Figures 1, 2A, 8, Column 8 Lines 44-67, Column 9 Lines 1-7).

Regarding claim 8 Vorih discloses the sensor monitors engine crank angle and wherein the control signal is generated in response to the engine crank angle being at a predetermined crank angle (See Figures 11A-11B).

Regarding claim 9 Vorih discloses the predetermined crank angle is approximately 528 degree of engine crank angle (See Figures 11A-11B).

Regarding claim 10 Vorih disclose the predetermined crank angle is approximately 498 degree to 558 degree of engine crank angle (See Figures 11A-11B).

Regarding claim 11 Vorih discloses the sensor monitors engine speed (See Column 9 Lines 28-32).

Regarding claim 12 Vorih discloses the sensor monitors temperature (See Column 9 Lines 28-32).

Claims 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yorita et al. (PN 5,363,816).

Regarding claim 13 Yorita discloses an actuator cylinder (See Figure 1 (9)) having a fluid passage (See Figure 1 (Space between (6) and (2)); an actuator piston (See Figure 1 (10)) reciprocatingly disposed in the actuator cylinder; and a control

valve (See Figure 1 (11)) operatively associated with the actuator cylinder, said control valve having a housing (See Figure 1 (12)), said housing having a low pressure (See Figure 1 (19)) fluid inlet, a high pressure fluid inlet (See Figure 1 (25)), and a fluid outlet (See Figure 1 (Between (9), and (11)), a plunger (See Figure 1 (14)) having first and second ends reciprocatingly disposed in the housing, the plunger being movable between a first position (See Column 6 Lines 32-50) at which the low pressure fluid inlet is in communication with the fluid outlet, and a second position (See Column 6 Lines 51-63) at which the high pressure fluid inlet is in communication with the fluid outlet, the fluid outlet (See Figure 1 (Between (9), and (11)) being in fluid communication with the actuator cylinder fluid passage (See Figure 1 (Space between (6) and (2)).

Regarding claim 14 Yorita discloses an electromagnetic device (See Figure 4 (26)) proximate the plunger first end, and a spring (See Figure 4 (Not numbered but clearly visible)) proximate the plunger second end, said plunger being movable to the first position upon deactuation of the electromagnet device (See Column 11 Lines 47-67, Column 12 Lines 1-11), said plunger being movable to the second position upon actuation of the electromagnetic device (See Column 11 Lines 47-67, Column 12 Lines 1-11).

Regarding claim 15 Yorita discloses an actuator plunger (See Figure 15 (End of (91)) operatively associated with the actuator piston and adapted to extend through an

aperture disposed in the actuator cylinder when the control valve plunger is in the second position (See Column 11 Lines 47-67, Column 12 Lines 1-11).

Regarding claim 16 Yorita discloses the actuator plunger is unitary with the actuator piston (See Figure 15 (End of (91)).

Claims 17-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Feucht et al. (PN 6,135,l073).

Regarding claim 17 Feucht discloses an engine piston (See Abstract, Figure 1) reciprocatingly disposed in the engine cylinder; a valve (See Figure 1 (11)) reciprocatingly disposed in a port extending from the engine cylinder; a first source of pressurized fluid (See Figure 1 (15)); a second source of pressurized fluid (See Figure 1 (16)), the second source being pressurized to a higher level (See Column 2 Lines 65-66) than the first source; and a valve actuator (See Figure 1 (30)) adapted to be in fluid communication with the first (See Column 3 Lines 12-15) and second (See Column 3 Lines 14-17) source of pressurized fluid, the first source taking up any lash (See Column 3 Lines 30-33) associated with the engine, the second source causing the valve actuator to open (See Column 3 Lines 14-17) the valve.

Regarding claim 18 Feucht discloses the valve actuator includes an actuator cylinder (See Figure 2 (31)) having an actuator piston (See Figure 2 (26)) reciprocatingly disposed in the actuator cylinder, and a control valve (See Figure 1

(20)) adapted to direct pressurized fluid from one of the first and second sources of pressurized fluid to the actuator cylinder (See 3 Lines 6-65).

Regarding claim 19 Feucht discloses a housing (See Figure 1 (20)) having a low pressure fluid inlet (See Figure 1 (P1)), a high pressure fluid inlet (See Figure (P2)), and a fluid outlet (See Figure 1 (21)); a spool (See Column 3 Lines 18-19) reciprocatingly disposed in the housing, the spool having first and second ends, the spool adapted to move from a first position connecting the low pressure fluid inlet (See Column 3 lines 6-51) to the fluid outlet to a second position (See Column 3 lines 6-51) connecting the high pressure fluid outlet to the fluid outlet; an electromagnetic device (See Column 3 Lines 18-19) operatively associated with the spool first end, the spool being movable to the second position (See Column 3 lines 6-51) upon actuation of the electromagnetic device; and a spring (See Column 3 Lines 18-19) operatively associated with the spool second end, the spool being movable to the first position by the spring upon deactuation of the electromagnetic device (See Figure 1 (20), Column 3 Lines 18-19).

Regarding claim 20 Feucht discloses the first source of pressurized fluid s a lubrication oil system of the engine (See Column 3 Lines 12-15).

Regarding claim 21 Feucht disclosesthe second source of pressurized fluid is a high pressure rail of the engine (See Column 2 Lines 65-66).

Regarding claim 22 Feucht discloses the valve is an exhaust valve (See Column 2 Lines 55-58).

Regarding claim 23 Feucht discloses the valve is an intake valve (See Column 2 Lines 55-58).

Regarding claim 24 Feucht discloses the valve actuator is fluidically (See Figure 1) driven, and wherein the engine further includes a mechanically driven actuator (See Column 2 Lines 55-58).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 25-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Warner (PN 6,439,195).

Regarding claim 25 Warner discloses an engine having an engine cylinder (See Figure 1 (68)), an engine piston (See Abstract) reciprocatingly disposed in the engine cylinder, a valve port (See Figure 1 (75)) in fluid communication with the engine cylinder, a valve (See Figure 1 (70)) reciprocatingly disposed in the valve port, a fluidically driven valve actuator (See Figure 1 (32)) operatively associated with the

valve, a mechanically (See Figure 1 (20), (2)) driven valve actuator operatively associated with the valve, a source of low pressure fluid (See Column 4 Lines 56-57), and a source of high pressure fluid (See Figure 4 (28)), the engine having intake, compression, power and exhaust strokes (See Figure 8, Column 6 Lines 43-67); supplying one of the low (See Column 4 Lines 56-57) and high pressure (See Figure 4 (28)) fluid sources to the fluidically driven actuator; opening the valve during one of the intake and exhaust strokes using the mechanically driven actuator (See Figure 8, Abstract, Column 3 Lines 5-22); and opening the valve during the compression stroke using the fluidically driven actuator (See Column 8 Lines 14-61).

Regarding claim 26 Warner discloses the opening steps are performed using an intake valve (See Column 2 Lines 4-6).

Regarding claim 27 Warner discloses the opening steps are performed using an exhaust valve (See Column 2 Lines 4-6).

Regarding claim 28 Warner discloses the opening step using the fluidically driven actuator is performed by connecting the source of high pressure fluid (See Figure 4 (28) to the fluidically driven actuator (See Column 5 Lines 10-21).

Regarding claim 29 Warner discloses the source of low pressure fluid is a lubrication oil system of the engine (See Column 4 Lines 51-56).

Regarding claim 30 Warner discloses the source of high pressure fluid is a high pressure rail of the engine (See Figure 1 (136)).

Regarding claim 31 Warner discloses the source of low pressure fluid is used to take up any lash in the system (See Column 1 Lines 62-63, Column 2 Lines 40-61).

Regarding claim 32 Warner discloses the engine further includes a control valve (See Figure 4 (30)) adapted to connect one of the low pressure (See Column 4 Lines 56-57) source and high pressure (See Figure 4 (28)) source to the fluidically (See Figure 1 (32)) driven actuator.

Regarding claim 33 Warner discloses the engine further includes a processor (See Column 2 Lines 56-59) and a sensor (See Abstract), the sensor being adapted to transmit a signal representative of engine operation (See Abstract) to the processor, the processor adapted to transmit (See Column 3 Lines 23-47) a signal to the control valve based on the signal from the sensor.

Regarding claim 34 Warner discloses the sensor is adapted to monitor one of the group of parameters consisting of engine speed (See Column 2 Lines 64-67), engine crank angle, temperature, engine load, and fuel delivery.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lindquist (PN 5,586,526), Bunker et al. (PN 6,067,946), Lindquist et al. (PN 5,732,678), Egashira et al. (PN 5,816,216) disclose similar engine valve actuators.

Any inquiry concerning this communication from the examiner should be directed to Examiner Jaime Corrigan whose telephone number is (703) 308-2639. The examiner can normally be reached on Monday - Friday from 8:30 a.m. – 6:00 p.m. 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (703) 308-2623. The fax number for this group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.

JC

Jaime Corrigan
Jaime Corrigan
Patent Examiner

September 4, 2003

Art Unit 3748

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